

WHAT IS CLAIMED IS:

1. An apparatus for correcting ink droplets placement errors for a recording apparatus, the recording apparatus recording images on a recording medium which is conveyed to a first direction by discharging ink droplets from a recording head part to the recording medium, the recording head part having a plurality of recoding heads in the first direction, the recording head having a plurality of recording head arrays, the recording head arrays having a plurality of recording head units in a second direction perpendicular to the first direction, the recording head units having a ink discharging surface, the apparatus for correcting ink droplets placement errors comprising:

an identifying unit for identifying ink droplets placement errors by the recording head units in the first direction; and

a controlling unit for controlling timing to discharge ink droplets by the recording head units to reduce ink droplets placement errors based on the errors.

2. The apparatus according to claim 1, further comprising:
a reading unit for reading images on a recording medium, the images being printed by the recording head part; and
a detecting unit for detecting the ink droplets placement errors in the first direction by each of the recording head units based on the reading images provided by the reading unit,

wherein the controlling unit controls the timing based on the errors provided by the detecting unit.

3. The apparatus according to claim 2, wherein the recording head units which are disposed in a staggered arrangement, the detecting unit further detects ink droplets placement errors of the recording head arrays, the controlling unit further controls timing to discharge ink droplets from the recording head units, based on the errors provided by the detecting unit.

4. The apparatus according to claim 3, wherein the detecting unit further detects ink droplets placement errors of the recording heads in the first direction, the controlling unit further controls timing to discharge ink droplets from the recording head units each of the recording heads to reduce the errors, based on the errors provided by the detecting unit.

5. An apparatus for correcting ink droplets placement errors for a recording apparatus, the recording apparatus recording images on a recording medium which is conveyed to a first direction by discharging ink droplets from a recording head part to the recording medium, the recording head part having a plurality of recording heads in the first direction, the recording head having a plurality of recording head arrays, the recording head arrays having a plurality of recording head units in a second direction perpendicular to the first direction, the recording head units having an ink discharging surface,

the apparatus for correcting ink droplets placement errors comprising:

an identifying unit for identifying ink droplets placement errors by the recording head arrays in the first direction; and

a controlling unit for controlling timing to discharge ink droplets by the recording head units to reduce the errors based on the errors.

6. The apparatus according to claim 5, further comprising: a reading unit for reading images on a recording medium, images being printed by the recording head part; and a detecting unit for detecting the ink droplets placement errors in the first direction provided by each of the recording heads based on the reading images provided by the reading unit, wherein the controlling unit controls the timing based on the errors provided by the detecting unit.

7. The apparatus according to claim 6, wherein the recording head units which are disposed in a staggered arrangement, the detecting unit further detects ink droplets placement errors provided by the recording heads in the first direction, the controlling unit further controls timing to discharge ink droplets from the recording head units of the recording head arrays to reduce the errors based on the errors by the detecting unit.

8. An apparatus for correcting ink droplets placement errors

for a recording apparatus, the recording apparatus recording images on a recording medium which is conveyed to a first direction by discharging ink droplets from a recording head part to the recording medium, the recording head part having a plurality of recording heads, the recording head having a plurality of recording head arrays in the first direction, the recording head arrays having a plurality of recording head units in a second direction perpendicular to the first direction, the recording head units which are disposed in a staggered arrangement, the recording head units having a ink discharging surface, the apparatus for correcting ink droplets placement errors comprising:

an identifying unit for identifying ink droplets errors by the recording heads in the first direction; and

a controlling unit for controlling timing to discharge ink droplets by the recording head units to reduce ink droplets placement errors based on the errors.

9. The apparatus according to claim 8, further comprising:
a reading unit for reading images on a recording medium, the images being printed by the recording head part; and
a detecting unit for detecting the ink droplets placement errors in the first direction by the recording head arrays based on reading images provided by the reading unit,
wherein the controlling unit controls timing based on the errors provided by the detecting unit.

10. The apparatus according to claim 9, wherein the controlling unit controls timing to discharge ink droplets roughly based on a printing pulse and controls timing to discharge the droplets finely based on a controlling pulse, wherein the controlling pulse has a higher frequency than that of the printing pulse.

11. The apparatus according to claim 10, wherein the printing pulse controls the timing to record on the medium for every line in the first direction.

12. An apparatus for correcting ink droplets placement errors for a recording apparatus, the recording apparatus for recording images on a recording medium which is conveyed to a first direction by discharging ink droplets from a recording head part to the recording medium, the recording head part having a plurality of recording heads, the recording head having a plurality of recording head arrays in the first direction, the recording head arrays having a plurality of recording head units in a second direction perpendicular to the first direction, the recording head units which are disposed in a staggered arrangement, the recording head units having a ink discharging surface, comprising:

an identifying unit for identifying ink droplets placement errors by the recording head units and the recording head arrays and recording heads in the first direction; and

a controlling unit for controlling timing to discharge

ink droplets by the recording head units to reduce ink droplets placement errors in the first direction based on a first ink droplets placement error provided by the recording head units, a second ink droplets placement error provided by the recording head arrays, and a third ink droplets placement error provided by the recording heads.

13. The apparatus according to claim 12, further comprising: a reading unit for reading images on the recording medium, images being printed by the recording head part; and a detecting unit for detecting the ink droplets placement errors in the first direction, the detecting unit having a first detecting unit for detecting the errors by the recording head units and a second detecting unit for detecting the errors by the recording head arrays and a third detecting unit for detecting the errors by the recording heads, based on the reading images provided by the reading unit, wherein the controlling unit controls timing based on the errors provided by the first or second or third detecting unit.

14. The apparatus according to claim 13, further comprising: a first controlling board having the first detecting unit and the second detecting unit; and a second controlling board having the third detecting unit and the controlling unit.

15. The apparatus according to claim 12, further comprising: a first controlling unit for controlling the recording head

units to discharge ink droplets from the surface of the recording head units; and

a second controlling unit for controlling the timing to discharge ink droplets from the surface of the recording head units by controlling the first controlling unit, the controlling units being provided with the each recording head arrays.

16. The apparatus according to claim 15, wherein the first controlling board has the first controlling unit and the first detecting unit and the second detecting unit, the second controlling board has the third detecting unit and the second controlling unit.

17. A recording apparatus for recording images on a recording medium which is conveyed to a first direction by discharging ink droplets comprising:

- a recording head part having a plurality of recording heads in a first direction,

- a plurality of recording head arrays having a plurality of recording head units in a second direction perpendicular to the first direction, the recording head arrays being held by the recording head, the recording head units having an ink discharging surface, the recording head units which are disposed in a staggered arrangement,

- an identifying unit for identifying a first and second and third error, which of them corresponding to the recording head units and head arrays and heads in the first direction;

and

a controlling unit for controlling timing to discharge ink droplets by the recording head units to reduce ink droplets placement errors in the first direction based on the first error provided by the recording head units, the second error provided by the recording head arrays, and the third error provided by the recording heads.

18. A correcting method for correcting ink droplets placement errors comprising the steps of:

detecting for at least one ink droplets placement errors, the errors comprising a first error due to an arrangement of each recording head units, a second error due to an arrangement of each recording head arrays, a third error due to an arrangement of each recording heads; and

controlling timing to discharge the droplets from the recording head units to reduce the errors based on at least the detected errors.